

REMARKS

Summary of the Office Action

Claims 2-15, 17 and 19-24 are considered in the Office Action.

Claims 2-15, 17 and 19-21 and 23 have been rejected under 35 U.S.C. § 103(a) as obvious over Yraceburu et al U.S. Patent No. 6,409,332 (“Yraceburu”) in view of Mittmeyer et al U.S. Patent No. 5,232,141 (“Mittmeyer”).

Claims 22 and 24 have been rejected under 35 U.S.C. § 103(a) as obvious over Yraceburu in view of Mittmeyer and Ju U.S. Patent No. 5,806,992 (“Ju”).

Reply

This application claims methods and apparatus that include a vacuum table having a substantially flat top surface, a moveable transport belt disposed above the top surface of the vacuum table, and a substantially flat porous sheet disposed between the top surface of the vacuum table and the transport belt, wherein the vacuum generated by the vacuum table creates a suction on a substrate placed on the transport belt, and the porous sheet restricts fluid flow between the table and the transport belt. The Office action asserts that the claimed invention is obvious based on Yraceburu and Mittmeyer. Applicants respectfully disagree.

Yraceburu describes an apparatus 10 that includes a vacuum box 307 having a lid 317 that essentially is an airflow filter. (Col. 5, lines 4-13 and lines 43-44). In particular, lid 317 is layered or graduated from a relatively porous coarse material 318 to a relatively dense fine material 323. (Col. 6, lines 6-10). Lid 317 functions to trap ink mist and paper dust, and provide flow restriction. (Col. 5, lines 38-65). A platen 311 is mounted atop lid 317, and includes an array of vacuum passageways, or ports, 315 distributed across the surface. (Col. 5, lines 16-17; Col. 6, lines 6-10; FIG. 3). A perforated transport belt 32 is disposed above platen 311, and is used to transport a paper sheet 16. (Col. 4, lines 16-17; Col. 5, lines 4-8; FIG. 3). As the Office action acknowledges, Yraceburu does not describe or suggest anything disposed between the top surface of platen 311 and transport belt 32.

Mittmeyer pertains to a suction roller arrangement for transporting web-form material. (Col. 1, lines 15-16). A suction roller is used to convert a torque into a

tractive force in webs of material in coating machines, such as for coating photo paper, film or magnetic tape. (Col. 1, lines 24-29). In particular, Mittmeyer describes a suction roller that includes a hollow cylindrical roller body 1 (also referred to as a rotor) made of a porous sintered material that rotates about a stator 2 that includes openings or holes 10 for transferring intake air to the interior 11 of stator 2. (Col. 2, line 59 through Col. 3, line 5). To create a differential air resistance along the length of the suction roller, roller body 1 has pores that have a larger diameter in the central portion of the roller body than in the peripheral portion 9, 9'. (Col. 3, lines 13-24). A web 6 of material is looped over a portion of the outside surface of roller body 1. (FIG. 2).

The Office action states that Yraceburu's apparatus includes "a porous sheet 318 or 323," and then states that it would have been obvious to locate "the porous sheet of the apparatus of Yraceburu . . . between the top of the vacuum table (top of 311) and the belt 32 as taught by Mittmeyer" because (1) the "porous material would provide the desired function of equalizing pressure distribution and filtering air whether placed above 311 or below it," and (2) "placing a porous sintered material against the belt provides the advantage of forming a uniform sliding surface as taught by Mittmeyer . . . for the belt to minimize wear and friction." A careful reading of Yraceburu and Mittmeyer indicates that the combination of Yraceburu and Mittmeyer, even if possible, is impractical and illogical.

First, contrary to the Examiner's suggestion, lid 17 cannot simply be moved from below to above platen 311 without affecting the operation of the overall apparatus. In particular, in describing a prior art vacuum device 201, Yraceburu notes that the use of smaller holes 207 in platen 211 caused several operational problems, including clogged holes with ink and paper dust. (Col. 4, lines 61-64). To overcome these problems, platen 311 includes vacuum ports 315 that are "large enough that they do not clog with ink or paper dust." (Col. 5, lines 37-38). Further, lid 317 is layered or graduated from a relatively porous coarse material 318 to relatively dense fine material 323. (Col. 6, lines 6-10). In this regard, "air flow through the coarse material region 321 at the floor of each port 315 is freer, removing ink mist, paper dust and other known ink-jet process contaminants through the ports 315," whereas "fine material 323 acts to restrict airflow to desired levels." (Col. 6, lines 10-15).

Thus, it is unlikely that lid 17 could effectively be moved between platen 311 and perforated transport belt 32, or that anyone would ever be motivated to do so. If coarse layer 318 were moved above platen 311 (either by itself, or in conjunction with fine material 323), perforated transport belt would no longer smoothly move across the surface of coarse material 318, particularly when contaminants become trapped in the coarse material. Further, if fine material 323 alone were sandwiched between perforated transport belt 32 and platen 311, the unfiltered contaminants would quickly clog the fine material, and render the system useless. Thus, contrary to the Examiner's assertion, placing either or both components of lid 17 between perforated transport belt 32 and platen 311 would actually increase wear and friction on the belt, and degrade system performance.


Further, it is illogical to suggest that anyone would ever be motivated to modify Yraceburu in the way that the Examiner suggests based on Mittmeyer. Yraceburu describes a vacuum apparatus in which sheet 16 is transported by transport belt 32 across a surface of flat platen 311 while ink is deposited onto sheet 16. Mittmeyer describes a vacuum apparatus in which web 6 is transported by cylindrical roller body 1 about stator 2, while a coating is applied to web 6. Thus, both references describe apparatus in which a moveable transport device (transport belt 32 or roller body 1) is disposed above or about the surface of a vacuum apparatus (platen 311 or stator 2), with nothing sandwiched between those elements. There is no logical reason why anyone reading Mittmeyer would somehow conclude that cylindrical roller body 1, which functions as a transport mechanism, should be flattened and then sandwiched between another transport mechanism (transport belt 32) and platen 311.

Indeed, the only reason for even considering the combination of Yraceburu and Mittmeyer is based on hindsight gleaned from applicants' disclosure, and such hindsight reconstruction is impermissible. Because the combination of Yraceburu and Mittmeyer, even if possible, would not produce the claimed invention, applicants respectfully request that the rejections of claims 21 and 23 be withdrawn. Because all other claims depend from either claim 21 or 23, applicants further respectfully request that the rejections of claims 2-15, 17, 19-20, 22 and 24 also be withdrawn.

Conclusion

For the reasons stated above, applicants submit that this application, including claims 2-15, 17 and 19-24, is allowable. Applicants therefore respectfully request that the Examiner allow this application.

Respectfully submitted,



James Trosino
Registration No. 39,862
Attorney for Applicants